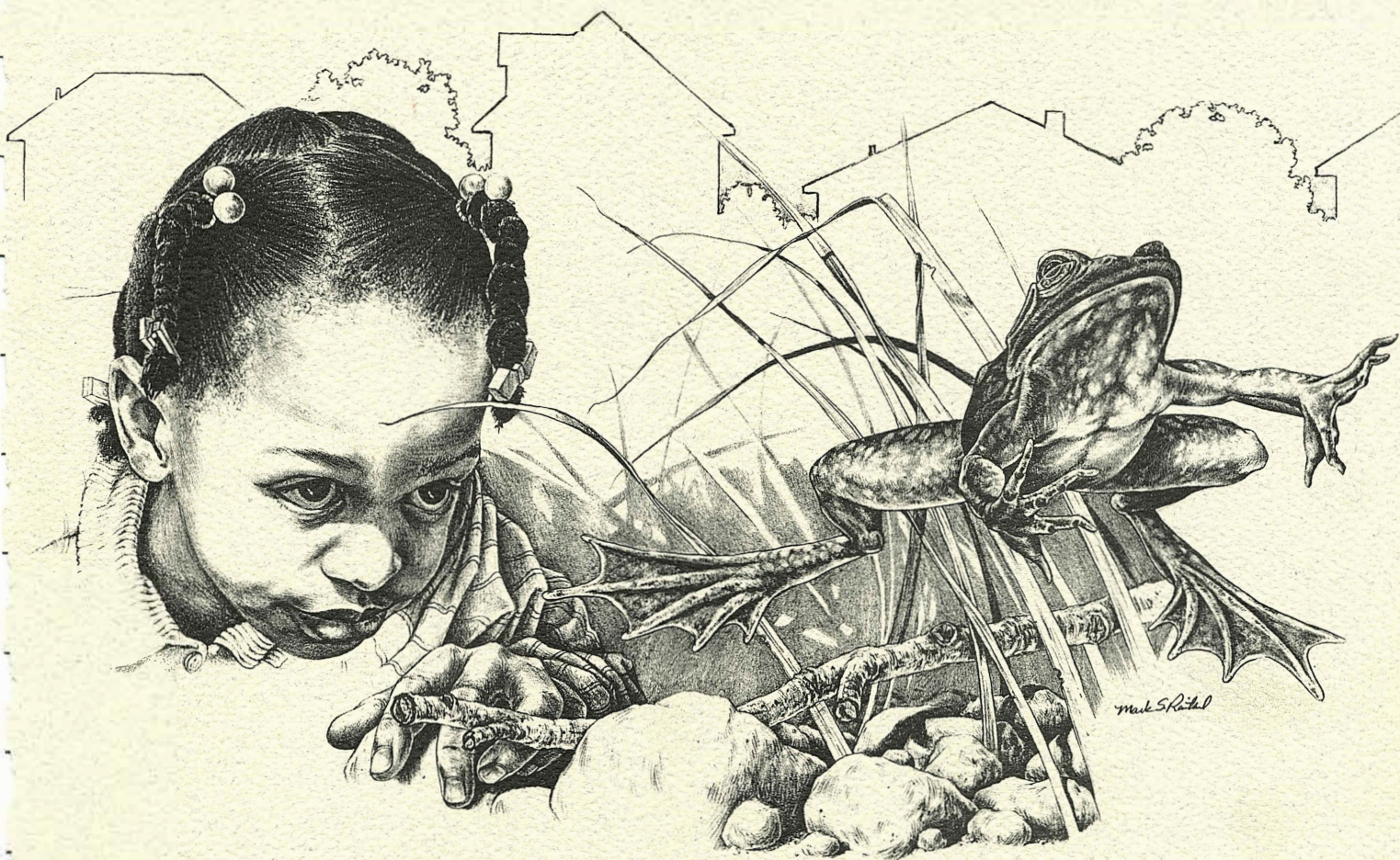


Report and Recommendations of the Governor's Task Force on Environmental Education: Creating an Environmentally Literate Citizenry



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**REPORT AND
RECOMMENDATIONS**

OF THE

**GOVERNOR'S TASK FORCE
ON ENVIRONMENTAL
EDUCATION:**

**CREATING AN ENVIRONMENTALLY
LITERATE CITIZENRY**

Presented To Governor Mel Carnahan

JULY 1994

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THE CALL FOR A MISSOURI ENVIRONMENTAL EDUCATION PLAN

Governor Mel Carnahan declared that without a sound, clean environment, Missouri cannot be economically viable. Without economic viability, Missourians will be unable to support solid environmental strategies, which are necessary to sustain a healthy environment that protects human health and maintains a high quality of life.

With this declaration in mind, Governor Carnahan signed Executive Order 93-39 on September 23, 1993, authorizing the creation of an environmental education task force. Fifty-one members, including representatives of local, state and federal agencies, public and private schools, environmental organizations, businesses, industries, professional education organizations and members of the General Assembly comprised the task force. Charged with the responsibility of developing a comprehensive environmental education plan for Missouri, the task force set out to create a plan to meet our state's current and future environmental education needs.

MESSAGE FROM THE TASK FORCE

The task force is keenly aware that a clean and healthy environment is critical to the quality of life and economic vitality of our state. The task force's objective is to develop an infrastructure to insure an environmentally literate citizenry that will effectively solve existing environmental problems, prevent new ones and maintain a sustainable environment for future generations. This objective evolved into the mission of the plan. We feel the following plan can achieve this mission.

Serving as co-chair representatives of the Governor's Task Force on Environmental Education certainly has been a gratifying experience. From the outset, we knew that the opportunity to develop a comprehensive environmental education plan for Missouri was unprecedented. But it was not until this project was complete that we could reflect upon the process where a diverse membership was able to transform individual components into a comprehensive plan. This latter accomplishment truly was an unexpected reward.

On behalf of the Governor's Environmental Education Task Force, we respectfully submit this document to Mel Carnahan, Governor of the State of Missouri.

Co-Chair Designees:

Ed Kissinger, Missouri Department of Conservation
Steve Schneider, Missouri Department of Natural Resources

LIST OF TASK FORCE MEMBERS & AFFILIATIONS

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This report would not have become a reality without the assistance and guidance of a large number of important individuals. However, special recognition is owed to the following:

Sharon Chilcoat, Missouri Department of Natural Resources

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EXECUTIVE SUMMARY

Missouri's economic viability depends upon the quality of the state's environment. Likewise, without economic stability, Missourians will not be able to adequately protect the environment.

In an effort to ensure both environmental quality and economic viability, Governor Carnahan charged a group of Missouri citizens with the task of proposing a plan to provide environmental education to all Missourians. The proposed plan will ensure that citizens understand the significance of natural and human relationships on the dynamics of ecosystems; the means to use natural resources yet sustain healthy ecosystems; and the issues surrounding misuse of the environment. Upon implementation of the plan, Missourians will be prepared with the understanding and skills necessary to recognize and evaluate existing or potential environmental problems, and will be able to act responsibly to take corrective steps.

The task force recommends establishing an environmental education coordinating council to guide the state environmental education plan; an office of environmental education to assist in implementing it; and an advisory committee to assist the council in its endeavors.

The plan addresses both the formal and nonformal education settings. In the formal arena, the task force proposes that environmental education be infused into curricula for grades pre-K through 12 and into courses offered at Missouri's colleges and universities. Opportunities for teacher pre-service and in-service programs are provided for in the plan. To facilitate this, regional grant programs are to be proposed to environmental educators.

Regarding nonformal education, the task force recommends initiatives such as the creation of regional environmental education centers to develop and coordinate activities and materials for environmental educators. The task force also recommends establishing a funding mechanism and offers various suggestions for funding sources.

The task force calls for maximizing collaboration and synergism among existing organizations with an interest in environmental education. This will achieve the essential prerequisite for successfully protecting Missouri's environment -- the creation of an environmentally literate citizenry.

Plan elements include:

- Environmental Education Coordinating Council**
- Technical Advisory Committee**
- Office of Environmental Education**
- Curricula for Pre-K Through 12**
- Pre-Service Teacher Education**
- In-Service Teacher Education**
- Higher Education**
- Nonformal Education**
- Funding**

The director of the Department of Natural Resources or the director's designee;

The director of the Department of Conservation or the director's designee;

The commissioner of the Department of Elementary and Secondary Education or the commissioner's designee;

The commissioner of Higher Education or the commissioner's designee;

The director of the Department of Agriculture or the director's designee;

The director of the Department of Economic Development or the director's designee;

The director of the Department of Health or the director's designee;

The director of the Department of Public Safety or the director's designee;

A representative of the office of the Attorney General;

A representative of the House of Representatives' Education Committee;

A representative of the Senate Education Committee;

A representative of the Missouri State Teachers Association;

A representative of the Missouri National Education Association;

A representative of the American Federation of Teachers;

A representative of the Missouri School Boards Association;

A representative of the Conservation Federation of Missouri;

A representative of the Missouri Farm Bureau;

A representative of the U.S. Department of Agriculture;

A representative of the U.S. Army Corps of Engineers;

A representative of the U.S. Forest Service;

A representative of the National Park Service;

Two classroom teachers to represent primary education;

One classroom teacher to represent "middle school" education;

Two classroom teachers to represent secondary education;

One college faculty member to represent higher education;

Three representatives of not-for-profit organizations involved in environmental education;

One representative of senior Missourians;

Four citizens with interest in environmental education, and;

Any other members which the Governor may, from time to time, appoint.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Missouri, in the City of Jefferson, on this 23rd day of September, 1993.




GOVERNOR

ATTEST:


SECRETARY OF STATE

IDENTIFYING MISSOURI'S ENVIRONMENTAL ISSUES

- * **Water Quality**
 - Groundwater, surface water
 - Water supply
- * **Air Quality**
 - Indoor, outdoor
 - Acid precipitation
 - Ozone depletion
- * **Energy Resources**
 - Fossil fuels
 - Energy conservation
- * **Quality of the Environment**
 - Biodiversity
 - Habitat loss, degradation
 - Endangered species, exotic species
 - Allocation of natural resources
 - Biotechnology
 - Aesthetic degradation
- * **Environmental Economics and Sustainable Development**
 - Jobs and the economy
 - Environmental protection versus economic development
 - Global population
- * **Solid and Hazardous Waste Management**
- * **Sustainable Agriculture**
 - Pesticides
 - Soil erosion
 - Point source pollution
 - Non-point source pollution
 - Threats to rural lifestyles and traditions
- * **Wise Land Use**
 - Urban and suburban sprawl
 - Property rights ("takings" issues)
 - Effects of Missouri entertainment and recreation potential (i.e. big reservoirs, shows, gambling)
- * **Global Climate Change**
 - Greenhouse enhancement
 - Health effects
 - Species loss
- * **Changing Citizenry Demographics**
 - Urban concentration
 - Isolation of citizenry from natural production
 - Public awareness and expectations
 - Fragmentation caused by special interest groups

THE TASK FORCE MISSION

In the interest of all Missourians, a comprehensive and multi-disciplinary environmental education plan should be developed and implemented to create an environmentally literate citizenry. That citizenry will effectively and efficiently solve existing environmental problems, prevent new ones and maintain a sustainable and quality environment for present and future generations. Target audiences for this comprehensive environmental education plan include formal education, encompassing pre-K through grade 12 and higher education, and nonformal education.¹

An environmentally-literate citizen is

- Knowledgeable of the challenges we face in protecting our natural resources.
- An effective member of society.
- Able to demonstrate civic and economic competence.

The characteristics of an environmentally literate citizenry include

A basic understanding of

- The natural environment (ecology).
- The dynamics of the built (human-made) environment.
- The cause-and-effect relationship between human behavior and the environment, and of the economics of that relationship.
- Environmental issues.
- The decision-making processes of governments, businesses, and other social, political, and economic institutions impinging upon environmental issues.

Development of

- The personal skills necessary for problem-solving, risk analysis and integrating diverse perspectives in order to understand and contribute to decision-making processes.
- The commitment to act for a healthy environment based on one's attitudes, knowledge and skills.

¹ Nonformal refers to environmental education conducted outside of traditional educational institutions. Target audiences for nonformal environmental education are abundant and diverse and include: the general public, youth, adult and senior citizen-groups, local government, businesses, industries, environmental and conservation organizations, the media, and ethnic, cultural and other community groups.

To achieve environmental literacy, a comprehensive environmental education plan must accomplish the following:

1. Provide citizens with an awareness and appreciation of natural resources through personal experiences and skill development.
2. Equip citizens with sufficient knowledge to permit them to make sound decisions with respect to environmental issues.
3. Provide citizens with a general awareness of how individual and collective actions may influence the relationship between quality of life and quality of the environment.
4. Provide citizens with the knowledge and skills necessary to permit them to investigate environmental issues and evaluate possible actions to address the issues.
5. Provide citizens with the skills necessary to implement responsible actions to maintain quality of life and quality of the environment.

RECOMMENDATIONS

I. ENVIRONMENTAL EDUCATION COORDINATING COUNCIL

OBJECTIVE: To establish an Environmental Education Coordinating Council (EECC) to oversee environmental education in the state of Missouri.

The EECC shall have the following responsibilities:

- A. Determine the needs and set the priorities for environmental education, both formal and nonformal.
- B. Approve a strategic environmental education plan as drafted by the Office of Environmental Education (OEE).
- C. Coordinate the implementation of the environmental education plan.
- D. Provide advice and assistance to the governor, the Legislature, state agencies and communities on policies and practices needed to provide environmental education.
- E. Serve as a forum for the discussion and study of problems that affect the environment and environmental education.
- F. Assure coordination of the environmental education programs of state agencies.
- G. Employ the director of the OEE.
- H. Approve programs and expenditures recommended by the OEE.

Implementation Strategy:

Create the EECC by executive order. This Council can serve as the focal point for environmental education in the state. However, to assure enduring attention to environmental education in the long-term, it may be advised to establish legislatively an Environmental Education Board.

The Council, ultimately the Board, should consist of seven members with knowledge and interest in environmental education. Three members should be classroom teachers. The EEC should be modeled after the Environmental Improvement and Energy Resources Authority (EIERA).

II. TECHNICAL ADVISORY COMMITTEE

OBJECTIVE: To establish a Technical Advisory Committee to assist the EECC on an as-needed basis and to coordinate environmental education efforts among state, federal and local agencies, and other interested entities. The committee will offer advice to the EECC as to how their agencies can work together to develop and implement environmental education activities.

The task force recognizes that environmental education cannot be addressed by government alone. It will require input and advice from entities involved in environmental education. Therefore, the task force recommends that the Technical Advisory Committee include interests from outside government. At minimum, agriculture, business and industry, environmental specialists, advocacy organizations and educational interests should be represented. The following recommended appointments should be made from persons identified by the Missouri Department of Conservation and Missouri Department of Natural Resources.

However, the task force also believes that the advisory process should be open. Provisions should be made to foster participation and allow input from all interested parties.

Implementation Strategy:

The Technical Advisory Committee to the EECC should be established by executive order. The EECC should be a mixture of government and non-government entities with functions relating to environmental education. Attention should be given to assure that the committee has ethnic and regional representation.

Government representation as noted under B below should be ex officio. Agencies represented should include the following because they are agencies with responsibilities to provide environmental education and their agencies' activities most likely will be impacted by a broader environmental education plan.

A. Governor-appointed members should include the following:

1. One member representing an environmental advocacy organization.
2. Two members representing two environmental education organizations.
3. One member representing business and industry.
4. One member representing labor community.
5. One member representing agriculture.
6. One professional environmental scientist.
7. One university or college faculty member.

B. State and local government membership should include the following: (members may choose designees)

1. Commissioner of Education.
2. Commissioner of Higher Education.
3. Commissioner of the Office of Administration.
4. Director of the Missouri Department of Natural Resources (MDNR).
5. Director of the Missouri Department of Conservation (MDC).
6. Director of the Environmental Improvement and Energy Resources Authority (EIERA).
7. Director of the Missouri Department of Agriculture.
8. Director of the Missouri Department of Economic Development.
9. Director of the Missouri Department of Health.
10. Director of the Missouri Department of Highway & Transportation.
11. Director of the Missouri Department of Public Safety.
12. Director of the Missouri Department of Labor & Industrial Relations.
13. One majority and one minority party member of the Missouri House of Representatives.
14. One majority and one minority party member of the Missouri Senate.
15. One member representing University Extension.
16. One member representing the Office of the Attorney General.
17. One member representing the Missouri Municipal League (organization to designate representative).
18. One member representing the Missouri Association of Counties (organization to designate representative).

C. Education community membership should include the following: (ex officio -- organizations are to designate representatives)

1. One member representing the Missouri School Boards Association (MSBA).
2. One member representing the Council of Public Higher Education (COPHE).
3. One member representing the Independent Colleges and Universities of Missouri (ICUM).
4. One member representing each of the following associations: Missouri Association of School Administrators (MASA); Missouri Association of Elementary School Principals (MAESP); Missouri Middle School Association (MMSA); and Missouri Association of Secondary School Principals (MASSP).

5. One elementary, one middle school and one secondary classroom teacher representing Missouri State Teachers Association, National Education Association and American Federation of Teachers. The organizations shall rotate the designated teacher classification (elementary, middle and secondary) representing them, so that only one representative from each organization sits on the committee at a time.

**D. Federal membership should include the following:
(ex officio)**

1. One member representing the Department of Energy.
2. One member representing the Environmental Protection Agency, Region VII.
3. Two members representing the U. S. Dept. of Agriculture.
 - a. One member representing the Soil Conservation Service.
 - b. Supervisor of the Mark Twain National Forest.
4. One member representing the U.S. Army Corps of Engineers (allow for rotation among Missouri district engineers).
5. Two members representing the U.S. Department of the Interior.
 - a. One member representing the Ozark National Scenic Riverways.
 - b. One member representing the U.S. Fish and Wildlife Service.

III. OFFICE OF ENVIRONMENTAL EDUCATION

OBJECTIVE 1: To create an Office of Environmental Education (OEE) to identify needs and suggest priorities for environmental education in Missouri.

The OEE shall have the following responsibilities:

- A. Prepare and implement an ongoing five-year strategic plan for environmental education at the direction of the EECC. A report to the governor and Legislature should be submitted on an annual basis.
- B. Assess the status of environmental literacy in the state's students, teachers and citizens on a regular basis. To accomplish this, the OEE shall develop an instrument to assess the environmental literacy in Missouri's citizenry, incorporating national research and assessments.

- C. Design, promote, offer and coordinate pre-service and in-service environmental education programs and workshops for both formal and nonformal education communities.
- D. Administer an environmental education grants program to fund both formal and nonformal education as approved by the EECC. The OEE shall provide recommendations for actual awards and recommend grant application and award criteria guidelines to the EECC. The EECC may award grants directly or delegate awarding authority to the OEE based on the guidelines. The program shall include:
 - 1. Grants to develop and administer teacher pre-service and in-service education programs.
 - 2. Stipends and scholarships awarded to individual teachers and other environmental educators to attend in-service training programs and take graduate course work in environmental education.
 - 3. Grants to individual teachers and other environmental educators to implement environmental education programs in the classroom and in informal learning settings.
 - 4. Competitive grants to individual faculty members and multidisciplinary teams at Missouri's colleges and universities for the development and implementation of graduate and undergraduate programs that promote environmental literacy.
- E. Work with Department of Elementary and Secondary Education (DESE) to develop environmental education materials and resources that will support integration of environmental education into curriculum frameworks.
- F. Work with and assist DESE and colleges of education in modifying current teaching certificates by the year 2000 to include a required course in environmental education for all graduating teachers.
- G. Function as an environmental education clearinghouse by:
 - 1. Staying abreast of environmental education issues and trends at local, state, national and international levels.
 - 2. Collecting and making information on environmental education materials.

3. Cooperating with state agencies and organizations in the development and distribution of an environmental education newsletter.
 4. Establishing and maintaining an electronic capacity to disseminate environmental education information and to network with interstate and federal programs.
- H. Cooperate with federal and state agencies and the private sector in developing, implementing, promoting and evaluating environmental education programs for both formal and nonformal audiences.
 - I. Help local school districts to develop and evaluate environmental education curricula.
 - J. Encourage state government and the private sector to adopt policies that are consistent with the environmental education plan.
 - K. Coordinate an annual governor's environmental education congress.
 - L. Create new and utilize existing recognition programs that support innovative or outstanding efforts in environmental education to be awarded at the annual congress. The OEE shall do the following:
 1. Compile a list of agencies, organizations and individuals that support innovative or outstanding efforts in environmental education.
 2. Compile a list of existing recognition programs related to environmental education or action.
 3. Encourage coordination and cooperation among groups offering recognition for environmental education or action.
 4. Select programs, actions and individuals to be recognized at the annual congress.
 - M. Establish guidelines for and award professional educators with an environmental certificate or endorsement.
 - N. Develop and maintain a memorandum of understanding to be approved by the EECC to specify methods by which state agencies may share their resources to assist in implementation of the environmental education plan.

Implementation Strategies:

- A. The task force's first preference is for the OEE to be a free standing entity. If this is not practical, then it should be attached administratively to a state agency.

The task force recommends that the state agency be EIERA because in this instance, the EIERA is perceived as an agency with a longstanding reputation in support of and with expertise in environmental education. In addition, due to the independent nature of EIERA, the task force believes that environmental education will have a high level of visibility and will not be lost in other agencies' activities.

- B. The OEE should be headed by a director selected by the EECC. The person appointed should have experience as an environmental educator and should have an administrative background. The director should have authority to select the OEE staff whose members should have appropriate expertise in environmental education.

OBJECTIVE 2: To implement the strategic plan and policies established by the EECC.

IV. CURRICULA FOR PRE-K THROUGH 12

OBJECTIVE 1: To integrate strategies for ensuring an environmentally literate citizenry into curriculum frameworks established under the Outstanding Schools Act and into local written curricula.²

Implementation Strategy:

Participate in curriculum activities established under the Outstanding Schools Act. Activities include participation in ad hoc committees for development of state curriculum frameworks. Also, work with local school districts as they develop local written curricula.

² Section 160.514(3), RSMo (Supp. 1993), states: "The State Board of Education shall develop written curriculum frameworks that may be used by school districts. Such curriculum frameworks shall incorporate the academic performance standards adopted by the State Board of Education pursuant to subsection 1 of this section. The curriculum frameworks shall provide guidance to school districts but shall not be mandates for local school boards in the adoption or development of written curricula as required by subsection 4 of this section."

OBJECTIVE 2: To make curriculum materials and resources available to support teaching efforts relating to environmental education.

OEE will assist local school districts to see this objective is accomplished.

OBJECTIVE 3: To incorporate the following objectives into voluntary state curriculum frameworks and to assist schools in incorporating these into local written curricula if requested.³

- The Appreciation and Awareness Stage
- The Ecological Foundations Stage
- The Analysis of Issues Stage
- The Investigation and Evaluation Stage
- The Environmental Action Skills Stage

Curriculum Objectives:

A. *Appreciation and Awareness*

Provide citizens with an awareness and appreciation of natural resources through personal experiences and skill development.

To accomplish this end, teachers should:

1. Promote environmental awareness and appreciation through direct and indirect experiences with local, state, national and international natural resources.
2. Instill knowledge about humans and the environment through individual and collective experiences to create awareness of the relationship between human survival and interactions with the environment.
3. Enhance physical fitness by creating opportunities to develop outdoor recreation skills.
4. Create opportunities to develop a respect for the biosphere. This respect will encourage people to maintain a healthy environment, providing benefits for themselves and others.

³ These objectives are taken in part from "Goals For Curriculum Development In Environmental Education," by Harold Hungerford, R. Ben Peyton and Richard J. Wilke.

B. *Ecological Foundations*

Equip citizens with sufficient knowledge to permit them to make sound decisions with respect to environmental issues. To accomplish this end, teachers should provide learning opportunities through a variety of experiences that accomplish the following:

1. Exemplify biochemical cycling (the natural processes that recycle nutrients in various chemical forms from the environment, to organisms, and then back to the environment.)
2. Allow individuals to understand the complexity of ecosystems.
3. Allow individuals to understand the need for biodiversity in the biosphere.
4. Allow individuals to understand the reality that human and natural forces continually shape and alter various conditions.
5. Allow individuals to understand how natural resources are defined by their usefulness to society and are the basis of the economy.

C. *Analysis of Issues*

Provide citizens with the opportunity to develop a general awareness of how individual and collective actions may influence the relationship between quality of life and quality of the environment.

To accomplish this end teachers should use secondary resources to:

1. Assess how human cultural activities, past, present and future, influence the environment from an ecological perspective.
2. Assess alternative actions and perspectives for specific issues with respect to their cultural, historical, social, economic, political and ecological implications.

D. *Investigation and Evaluation*

Provide citizens with the knowledge and skills necessary to permit them to investigate environmental issues and evaluate alternative actions. This stage should provide educational opportunities for students and citizens to participate in implementing the identified skills.

To accomplish this end teachers should provide opportunities for citizens to:

1. Analyze and assess natural and manmade events as they become issues.
2. Develop and administer surveys and conduct research on local, state, national and global environmental issues.
3. Analyze and assess data collected from surveys and research.
4. Assess and analyze data necessary to achieve the goal of establishing and maintaining a dynamic equilibrium between quality of life and quality of the environment.
5. Identify and analyze alternative actions with respect to political, social, economic, cultural, historical and ecological implications.

E. *Environmental Action Skills*

Provide citizens with the skills necessary to implement responsible environmental actions to maintain a dynamic equilibrium between quality of life and quality of the environment.

To accomplish this, teachers should provide citizens with the following:

1. Skills necessary for planning responsible actions for ecosystem management.
2. The opportunity to develop a plan of action in response to their issue investigation.
3. The opportunity to use skills of assessment and analysis to evaluate proposed action plans.

V. PRE-SERVICE TEACHER EDUCATION

OBJECTIVE 1: To provide training in environmental education as part of pre-service and graduate-level course work for teachers.

- A. Pre-service education programs should encourage and enable teachers to promote and teach environmental literacy objectives. Consequently, programs should enable teachers to provide citizens with the following:

1. An awareness and appreciation of natural resources through personal experiences and skill development.
2. Sufficient knowledge to permit them to make sound decisions with respect to environmental issues.
3. A general awareness of how individual and collective actions influence the relationship between quality of life and quality of the environment.
4. The knowledge and skills necessary to permit them to investigate environmental issues and evaluate alternative actions.
5. The skills necessary to implement responsible environmental actions to maintain a dynamic equilibrium between quality of life and quality of the environment.

Implementation Strategy:

Modify the current certification requirements to include a required course(s) in environmental education for all teachers graduating by the year 2000. Instruction should include content related to environmental literacy, methods for delivery and infusion into the curriculum. The OEE should assist DESE and colleges of education in accomplishing this activity.

VI. IN-SERVICE TEACHER EDUCATION

OBJECTIVE 1: To implement a program of teacher in-service training in environmental education no later than the 1996-97 academic year.

Teacher in-service education programs should be established to enable teachers to integrate environmental education into their classrooms.

Implementation Strategies:

- A. The OEE shall establish and administer scholarships, stipends and honoraria as incentives to encourage teachers to complete approved graduate courses and in-service training programs, participate in regional educator's councils and lead teacher education workshops.

- B. In cooperation with DESE, employ the current system of regional educators' councils to plan and implement programs to enhance classroom delivery of environmental education. Councils should provide peer review and recommendations on mini-grant applications in their region and should hold regional conferences to broaden outreach and training, increase the visibility of environmental education efforts among educators and involve the larger community in environmental education programs.
- C. The OEE should establish criteria for and offer an environmental endorsement or certificate recognizing classroom teachers for acquiring special knowledge related to environmental education.

VII. HIGHER EDUCATION

OBJECTIVE 1: To integrate objectives of environmental literacy into all undergraduate degree programs in Missouri's institutions of higher education by the year 2000.

Implementation Strategies:

- A. Encourage Missouri's institutions of higher education to recognize the need to evaluate the environmental literacy of graduating students.
- B. Work with Missouri's colleges and universities to incorporate environmental studies that promote the objectives of environmental literacy into curriculum requirements.

OBJECTIVE 2: To make available graduate and undergraduate courses that relate to the objectives of environmental literacy.

- A. Design curricula that meet the environmental literacy objectives which are to:
 - 1. Provide citizens with an awareness and appreciation of natural resources through personal experiences and skill development.
 - 2. Equip citizens with sufficient knowledge to permit them to make sound decisions with respect to environmental issues.
 - 3. Provide citizens with a general awareness of how individual and collective actions may influence the relationship between quality of life and quality of the environment.

4. Provide citizens with the knowledge and skills necessary to permit them to investigate environmental issues and evaluate alternative actions.
5. Provide citizens with the skills necessary to implement responsible environmental actions in order to maintain a dynamic equilibrium between quality of life and quality of the environment.

Implementation Strategy:

The OEE shall award competitive grants to individual faculty members or multidisciplinary teams at Missouri's colleges and universities for the development and implementation of graduate and undergraduate programs that promote environmental literacy.

VII. NONFORMAL EDUCATION

OBJECTIVE 1: To create and support nonformal environmental education programs that incorporate the objectives of environmental literacy.

Implementation Strategies:

The OEE shall:

- A. Develop policy documents that recognize the importance of environmental education and establish program guidelines. Such guidelines should encourage public agencies, industries, businesses and private organizations to adopt formal policies acknowledging the need for environmental education and action. Such entities should be encouraged to recognize and promote the value of integrating environmental literacy objectives through their public information offices and other programs.

Methods of implementation should include providing public agencies, industries, businesses and private organizations with a written set of environmental principles generated by the EECC enabling them to voluntarily adopt and incorporate these principles.

- B. Promote models of environmental responsibility at public and private facilities. This can be accomplished by encouraging public agencies and organizations to serve as community models by actively demonstrating environmental literacy objectives. Examples may include water and energy conservation, integrated pest management, native plant landscaping and regional resource planning.

- C. Commence operation of a statewide network for environmental education by establishing Regional Environmental Education Centers (REECs) to be hosted by an area environmental organization but to be funded by the OEE. The center staff, which should not consist of state employees, should assist environmental educators in the following:
 - 1. Coordinating regional environmental education efforts.
 - 2. Identifying target audiences.
 - 3. Aiding in the development of programs and materials.
 - 4. Publicizing a speaker's bureau and program bureau.
 - 5. Disseminating information on programs and materials for schools, businesses, industries and the general public.
 - 6. Identifying and inventorying existing environmental education programs offered through nonformal sources (i.e. industries, businesses, university extension offices, etc.).
 - 7. Facilitating program sharing among formal and nonformal education providers.
 - 8. Cooperating with regional educators' councils to enable environmental educators who are not classroom teachers to participate in workshops or other in-service training programs which focus on environmental education.
- D. Evaluate the status of the citizens' environmental literacy through the OEE by developing an instrument to assess environmental literacy and action of Missouri's citizenry.
- E. Implement an integrated program of nonformal, continuing education (life-long learning) programs for adults by:
 - 1. Ensuring that an environmental education database is made easily available to the citizens of Missouri. The REECs will work with the OEE to establish the computer network in publicly accessible locations such as public libraries, public agencies and non-profit institutions.

- C. Up to 15 percent of state funds and matching funds may be used by the OEE for grant administration and project management. The rest must be expended for programs.

OBJECTIVE 3: Provide long-term funding for future environmental education needs.

Implementation Strategies:

- A. The OEE should identify future funding sources and direct allocations of existing available funds for environmental education.
- B. The OEE should identify potential funding sources as a part of its update of the environmental education plan. Sources that should be considered include the following:
 - 1. Usage of environmental fines, fees and penalties;
 - 2. Savings from energy and water conservation audits and bonding for capital costs for energy and water conservation.
- C. By October 1 of each year, the OEE should recommend to the governor and Legislature, expenditures of funds for state environmental programs for the ensuing fiscal year. The basis for these recommended expenditures is to avoid duplication, ensure coordination and further the implementation of the state environmental education plan.
- D. If a state bottle deposit law is enacted in Missouri, revenue should be dedicated to environmental education.

APPENDICES

APPENDIX I

SOURCES OF AUTHORITY:

Though not meant to be an exhaustive list, the following sources of federal and state legislative and executive authority are fundamental to the development of an environmental education plan for Missouri. These sources include:

FEDERAL AUTHORITY:

The National Environmental Education Act, 20 U.S.C.A. § 5501

The National Environmental Education Act recognizes the importance of addressing threats to human health and environmental quality, and declares that current federal efforts to inform and educate the public concerning the natural and built environment and environmental problems are not adequate. The act further states that the federal government, through the efforts of the Environmental Protection Agency, should work with local education institutions, state education agencies, not-for-profit educational and environmental organizations, noncommercial educational broadcasting entities, and private sector interests to support development of curricula, special projects, and other activities, to increase understanding of the natural and built environment and to improve awareness of environmental problems.

Section 2 declares that the policy of the United States is to establish and support a program of education on the environment, for students and personnel working with students, through activities in schools, institutions of higher education, and related educational activities, and to encourage post-secondary students to pursue careers related to the environment. Consequently, the National Environmental Education Act serves as a federal mandate to encourage environmental education at all levels: local, state and national.

STATE AUTHORITY:

Executive Order 93-39

Signed on September 23, 1993, this executive order established the Governor's Task Force on Environmental Education created to develop a comprehensive environmental education plan for the state. The purpose of an environmental education plan, according to executive order language, is to identify environmental issues, address coordination of environmental education within Missouri and develop implementation strategies for the delivery of environmental education to Missouri's students. The mandate clearly defines the importance of environmental education in ensuring a quality environment for present and future Missourians.

Outstanding Schools Act, Section 160, RSMo (Supp. 1993)

This act mandates the development of academic performance standards from which curriculum frameworks will be developed. Curriculum frameworks may be used by local school districts but are not mandated. The integration of environmental education into these curriculum frameworks should be encouraged as such frameworks are being developed and revised.

Missouri Solid Waste Laws of 1990, Section 260, RSMo (1986 and Supp.)

Two sections in this act are of particular importance to a Missouri environmental education plan. The first is Section 260.273, which states that 10 percent of a fee collected from the sale of new tires by tire retailers may be allocated "upon appropriation, to the Department of Natural Resources to be used cooperatively with the Department of Elementary and Secondary Education for the purposes of developing educational programs and curricula pursuant to Section 260.342."

This later section states that educational programs shall address issues such as "the relationship between an individual's consumption of goods and services, the generation of different types and quantities of solid waste and the implementation of solid waste management priorities . . . and shall also address other environmental concerns associated with solid waste management including energy consumption and conservation; air and water pollution; and land-use planning."

NATIONAL ENVIRONMENTAL EDUCATION ACT

P.L. 101-619, see page 104 Stat. 3325

DATES OF CONSIDERATION AND PASSAGE

Senate: October 26, 1990

House: September 28, October 27, 1990

House Report (Education and Labor Committee) No. 101-671,

Aug. 4, 1990

[To accompany H.R. 3684]

Cong. Record Vol. 136 (1990)

RELATED REPORT

Senate Report (Environment and Public Works Committee) No.

101-284, May 11, 1990

[To accompany S. 1076]

No Senate Report was submitted with this legislation. The House Report (this page) is set out below, and the President's Signing Statement (page 4655-1) follows.

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The Committee on Education and Labor, to whom was referred the bill (H.R. 3684) to increase public understanding of the natural environment and to advance and develop environmental education and training, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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SUMMARY OF THE LEGISLATION

The National Environmental Education Act (H.R. 3684) is intended to renew and reestablish the Federal role in environmental education. It is designed to complement the existing environmental education programs now being implemented by nonprofit organizations, local and State educational agencies, and various Federal agencies (e.g. Fish and Wildlife Service, National Forest Service). The legislation establishes an Office of Environmental Education within the Environmental Protection Agency, calls for an expanded and varied program of curriculum development and dissemination, and teacher training, provides grants for model projects and for seminars and meetings of practitioners, provides small grants to local school systems and colleges, supports college level environ-

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mental interns in Federal agencies, and provides national and regional awards to recognize excellence in environmental education, and authorizes other activities to further the purpose of the Act.

The legislation also establishes a foundation which, through attracting funds from the private sector by offering matching Federal monies, will supplement and augment the environmental education and training activities under this Act.

LEGISLATIVE HISTORY

The National Environmental Education Act, H.R. 3684, was introduced by Mr. George Miller of California and 39 original cosponsors on November 17, 1989. The bill was referred to the Committee on Education and Labor and to the Subcommittee on Select Education. On April 19, 1990, the Administrator of the Environmental Protection Agency, Mr. William Reilly, Senator Chafee, and a number of other witnesses gave testimony in Washington, D.C. on the bill.

There were three panels at the April 19 hearing. Those testifying were: Mr. Reilly, Administrator, Environmental Protection Agency; Senator John Chafee, U.S. Senator from the State of Rhode Island; Mr. John Denver, President of Windstar Foundation; Dr. Gary San Julian, Vice President of Research in Education, National Wildlife Federation; Professor Terry Wilson, Director, Mathematics, Science and Environmental Education, Western Kentucky University; Mr. Darryl Roberts, adventurer; Mr. Steve Kussman, Chairman, Alliance for Environmental Education; and Dr. Kathleen Blanchard, Quebec-Labrador Foundation.

On July 26, 1990, the Committee on Education and Labor considered the bill, H.R. 3684. After adopting an amendment in the nature of a substitute offered by Mr. Jontz, on behalf of Mr. Owens, the Committee ordered the bill reported by unanimous voice vote.

HISTORY AND NEED FOR THE LEGISLATION

There is increasing concern for the need to preserve the ecological foundations of our planet. As environmental issues grow increasingly complex and interrelated, the need to more fully educate the public becomes more critical. Whether we talk about the consequences of global warming, the dangers of chlorofluorocarbons (CFCs) in the atmosphere, or the reasons to re-cycle waste products, public awareness of the underlying issues becomes key to the success of public policy in this area. The costs of various kinds of "environmental disasters", such as the Exxon Valdez and toxic waste dumps such as Love Canal, has become unacceptably high, and can, in part, be traced back to a lack of environmental education at very high levels. The modest revival of the Federal effort in this area is an investment in prevention that will be vastly less costly than the consequences of ignorance.

The twentieth anniversary of Earth Day this past April highlighted the renewed interest of the citizens and the government of this country in ensuring that our future generations will be able to benefit from our abundant natural resources and will be able to

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live in safe and clean neighborhoods. A program of environmental education will be necessary to sustain this commitment.

In the past there were unsuccessful efforts to establish a Federal role in this area. In 1970 legislation was enacted to establish an Office of Environmental Education within the Department of Health, Education, and Welfare (HEW) (with amendments in 1974 and 1978). There was tension between the Executive and Legislative branches as to the precise nature of the program that should be adopted, the differences being reflected in declining appropriations. Today, the U.S. Office of Environmental Education does not exist. While other environmental educational activities have been facilitated through such agencies as the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the National Park Service, there is a fragmentation of effort in the environmental education field which a central office of Environmental Education could help to alleviate. Such an office would not duplicate ongoing activity, but would be a viable force towards improved coordination.

EXPLANATION OF THE AMENDMENT TO THE NATIONAL ENVIRONMENTAL EDUCATION ACT

H.R. 3684 would require the Administrator of the Environmental Protection Agency to establish an Office of Environmental Education within the Environmental Protection Agency in 1992 and would authorize it from 1992 for four years. Additionally, the bill would establish a National Environmental Education Foundation for four years.

Witnesses at the hearing underscored a number of important points included within the bill. In the formal education sector, witnesses stated that environmental education should be infused across the curriculum; that environmental education and training, networking, and the development of partnerships across both traditional and non-traditional boundaries were the key to empowering the process of environmental learning and environmental protection. The Committee is aware of the important role of seniors in highlighting that environmental education and training is a life-long process. It continues in the workplace, at home through the media, and in other venues after formal schooling has been completed. Senior citizens should participate in the Environmental Education Advisory Council.

The Committee recognized that EPA already has a national advisory council, the National Advisory Council for Environmental Policy and Technology (NACEPT), that advises the Administrator on environmental education and training policy. The Committee recognizes that the Administrator would not need a second advisory council to meet this need, and recommends that the Administrator make the transition to the Advisory Council contained in the bill in such a fashion as to minimize disruption in the flow of such advice.

The Committee recognizes the important roles the U.S. Department of Education, the Department of Defense, the Department of Agriculture, and the Department of Energy play in the Nation's efforts to solve environmental problems. Coordination with these en-

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tities is vital. For this reason, the Committee specifically included these Departments in the Environmental Education Task Force.

The Committee intends that the Office shall develop and support efforts to improve the understanding of the man-made environment. There are a number of environmental programs around the country that address the urban environmental issues, and the Committee anticipates that funding allocations will reflect that a majority of the Nation's population is concentrated in cities and metropolitan urban areas. Environmental pollution in the form of asbestos in school buildings, air and water pollution, aggravated by the presence of industrial waste products, are as real and, perhaps, as little understood to inner-city dwellers as acid rain and endangered species of wildlife are to those who dwell in more rural areas of the country. Additionally, there was testimony offered by the National Wildlife Foundation that we should not overlook the "importance of educating nonformal audiences to include materials for ethnic and culturally diverse peoples and individuals with special education needs."

The Committee recognized that, given the wealth of information on environmental education and training resources, there was a need to exploit existing user-friendly electronic communication technology to develop a network that would help coordinate and use information more effectively and efficiently.

The Committee recognizes the importance of public broadcasting stations in implementing the goals of this legislation, and has made specific references in the bill to their eligibility for the programs being authorized. Because of the community based nature of public broadcasting stations, their ability to offer diverse services such as education and training, their outstanding track record in environmental programming, and their potential for reaching large numbers of people, the Committee encourages the involvement of these stations in all aspects of the Environmental Education Act.

The Committee is concerned about the underrepresentation of minorities in the field of environmental education, and encourages the Administrator to ensure that historically black colleges and universities (HBCUs) and minority institutions are well represented among the recipients for funding. Witnesses discussed the critical role minorities can and will play in solving environmental problems. The Committee is also aware of the critical role native Americans must play in the protection and restoration of the environment. The Committee notes the existence of Executive Order 12320, designed to increase the participation of the 101 HBCUs in federally-sponsored programs, and that more action is needed.

The Committee recognizes that many vital environmental problems are global and require unprecedented levels of cooperation among nations. This cooperation can only be achieved on the basis of shared awareness of environmental problems between citizens of the United States and those of other nations, including a common international base of knowledge regarding the origins of environmental problems and how these problems can be addressed. To this end, the Federal Government, through this and other programs, should work with other governments and not-for-profit international education organizations to develop and support programs to pro-

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mote international environmental education to assure the highest level of international cooperation in environmental fields.

For these reasons, the bill provides for a range of world environmental activities for the development of these environmental education resources, including the development of materials and international fellowships and internships. International environmental education activities conducted under this Act should be conducted in consultation with the Department of Education's Center for International Education.

EPA Administrator William Reilly testified that the Administration could not support the Trust Fund provision in the original version of the bill. He recommended that an Environmental Education and Training Foundation, modeled after the Fish and Wildlife Foundation, be created to help fund national and international environmental education and training networks and programs. The substitute amendment to H.R. 3684 establishes such a Foundation. The major purpose of the National Environmental Foundation will be to develop, support and/or operate a system of programs or projects to educate and train educational and environmental management professionals and to assist them in the development and delivery of environmental education programs and studies. The program will be implemented through a national and international network of environmental education and training centers located within institutions of higher learning, graduate professional schools, not-for-profit environmental education or training organizations, or other such institutions.

The Committee recognized that governmental/public sector funding for environmental education and training has been sporadic and insufficient to the task. A prime example of this was the 1970 version of the National Environmental Education Act that received less than \$4 million a year, although authorized at \$15 million. It was then "zeroed out" entirely. The Committee noted that the private sector has been steadily increasing its funding of local, regional, and national environmental and training projects. It is hoped that the private sector will continue this pattern of growth in contributions, if this giving is in partnership with the Federal Government. The successful example of the National Fish and Wildlife Foundation, created by Congress within this context, was brought to the Committee's attention.

OVERSIGHT FINDINGS OF THE COMMITTEE

Findings from the hearings of the Subcommittee on Select Education contributed to the Committee consideration of this bill.

OVERSIGHT FINDINGS AND RECOMMENDATIONS OF THE COMMITTEE ON GOVERNMENT OPERATIONS

In compliance with clause 2(1)(3)(D) of rule XI of the Rules of the House of Representatives, no findings or recommendations by the Committee on Government Operations were submitted to the Committee with reference to the subject matter of H.R. 3684 or with reference to the bill.

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CONGRESSIONAL BUDGET OFFICE ESTIMATE

The Congressional Budget Office has estimated the following costs to the Federal Government in implementing this legislation. The Committee concurs in these estimates and adopts them in compliance with clause VII of rule 13. No cost estimates have been received from any other Federal department or agency.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, July 31, 1990.

Hon. AUGUSTUS F. HAWKINS,
Chairman, Committee on Education and Labor,
U.S. House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 3684, the National Environmental Education Act.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

ROBERT D. REISCHAUER,
Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 3684.
2. Bill title: National Environmental Education Act.
3. Bill status: As amended and ordered reported by the House Committee on Education and Labor on July 26, 1990.
4. Bill purpose: H.R. 3684 would establish a federal program for environmental education. This program would be guided by a newly established Office of Environmental Education within the Environmental Protection Agency (EPA). Under the bill, this office would develop and support environmental education and training programs, manage grants, oversee internships, and administer education awards. The bill also would create an Environmental Education Advisory Council, a Federal Task Force on Environmental Education, and a National Environmental Training Foundation.
5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1991	1992	1993	1994	1995
Authorizations					
Specified		11.5	11.5	13.5	13.5
Estimated	0.4	1.8	1.8	1.9	2.04
Total authorizations4	13.3	13.3	15.4	15.5
Estimated outlays3	9.1	12.8	14.7	15.4

The costs of this bill fall primarily within budget function 300.
Basis of estimate: For the purposes of this estimate, it is assumed that H.R. 3684 will be enacted late in fiscal year 1990 and that the full amounts authorized will be appropriated for each fiscal year. Outlays have been estimated on the basis of allocations specified in

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the bill, historical spending patterns for similar programs, and information obtained from EPA.

The bill would authorize the appropriation of \$10 million annually for 1992 and 1993, and \$12 million annually for 1994 and 1995. Of these amounts, 30 percent would be available for the Office of Environmental Education, 30 percent for the environmental education and training program, and 40 percent for environmental education grants. H.R. 3684 also would authorize \$1.5 million annually over the 1992-1995 period for the National Environmental Training Foundation.

H.R. 3684 would require EPA to establish 150 internships each year for college students. CBO estimates that the internships would result in costs of about \$1.5 million a year to the various federal agencies that would hire the interns.

The bill would establish a National Environmental Education Advisory Council and a Federal Task Force on Environmental Education. The advisory council would consist of 16 members, who would receive compensation and allowances for performance of their duties. CBO estimates that the council would result in costs of up to \$300,000 each year. The task force would consist of representatives of various federal government agencies and would be charged with preparing a biennial report on environmental education. CBO estimates that the task force would cost about \$100,000 in both fiscal years 1991 and 1992, and cost up to \$60,000 annually in subsequent years.

6. Estimated cost to State and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Kim Cawley.

10. Estimate approved by: C. G. Nuckols, for James L. Blum, Assistant Director for Budget Analysis.

INFLATIONARY IMPACT

The private sector donations and the alleviation of negative conditions within the environment, which should result directly from the programs authorized in this measure, should lead to a decreased need for Federal spending, at least of the remedial kind. Therefore, this legislation should have an anti-inflationary impact.

SECTION-BY-SECTION ANALYSIS

Section 1—Short title and table of contents.

Section 2—Findings setting out the need for coordinated efforts in the area of education on environmental topics, issues, and concerns, and stating that it is the purpose of this Act to accomplish such coordination between Federal agencies and State and local education agencies, not for profit environmental organizations, noncommercial education broadcasting entities, and private sector interests.

Section 3—Definitions.

Section 4—Directs the Administrator of the Environmental Protection Agency (hereinafter Administrator) to establish an Office of Environmental Education (hereinafter Officer) within the E.P.A. sets out the scope of activities for this Office, which includes ad-

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ministration of programs under this Act. Requires that the Office be directed by a Director (who shall be a member of the Senior Executive Service), shall have a headquarters staff of not less than 10 full-time equivalent employees, and shall have not less than one full-time employee in each Agency regional office.

Section 5—Establishes an Environmental Education and Training program to train educational professionals in the development and delivery of education and training programs and studies. Authorizes a number of activities, including, but not limited to, classroom training and curricula development and dissemination activities (including those to meet the needs of diverse ethnic groups), field studies, international exchanges, maintenance and support of library resources, evaluation and dissemination, and sponsorship of seminars and conferences. Also authorizes the sponsoring of public, private and governmental partnerships and networks. Special emphasis shall be placed on efforts which are protable and can be readily disseminated. Grants can be made to not for profit institutions of higher education and research entities (or consortia of same) and a number of grant requirements are spelled out. Evaluation and review procedures must be established. Participants may be teachers, faculty, administrators, related support staff associated with local and State education agencies, institutions of higher education, environmental and natural resources agencies and certain others. Selection criteria are set forth.

Section 6—Authorizes the Administrator to enter into a cooperative agreement or contract or a grant to design, demonstrate, or disseminate practices, methods and techniques related to environmental education and training. Activities include curricula design, development and dissemination, evaluation and assessment of pollution problems and other field studies, specific educational personnel training, and international cooperation activities. Priority activities are stipulated. The Administrator is to develop regulation to foster competition and to set forth selection, supervision, and evaluation criteria. The first solicitation is to be within 180 days. Any State or local education agency, college or university, environmental agency, non-profit organization, or noncommercial educational broadcasting entity may qualify under this section. Federal portion of activities under this section shall not exceed 75 percent of the cost, subject to in-kind contribution and authority for the Administrator to waive this requirement. Grants under this section may not exceed \$250,000 per year, and at least 25 percent of the funds obligated under this section shall be for grants for not more than \$5,000.

Section 7—The Administrator shall, in consultation with the Office of Personnel Management and other appropriate agencies, provide internships and fellowships for in-service teachers with Federal agencies. Sets out purpose, limitation to 150 such internships per year, the management of the program, and salary and personal limitations.

Section 8—Authorizes three specific awards, to be presented for outstanding service in a number of specified disciplines or fields.

Section 9—Establishes a Federal Advisory Council and Federal Task Force on Environmental Education. The Council shall have 16 members, specific numbers of whom are to be appointed by the Ad-

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ministrator from a number of specified disciplines. Terms, per diem and compensation, and duties are stipulated. A report on activities under this Act, and other activities needed, is to be submitted to the public and the Congress every two years. The Federal Task Force, made up of representatives of stipulated agencies, shall make recommendations for coordinating Federal activities in this area and report same to Congress.

Section 10—Establishes the National Environmental Education Foundation to be directed by a 19 member Board of Directors, appointed by the Administrator, with ex officio representation offered to other Federal entities. The purposes of the Foundation are to encourage, accept, and administer private donations for environmental education activities consistent with this Act, to undertake activities to raise the public consciousness, and to participate in international efforts. Specific activities, and projects to be funded, will be determined by the Board. Terms, Officers compensation, and other internal matters are stipulated, as are certain rights and obligations of the Foundation and the Board. The Foundation will not be a Federal agency. The administrator is to provide support, and there are provisions limiting Federal liability, allowing acceptance of volunteer service, and setting forth audit reporting requirements.

Section 11—Authorizations.—The authorization for the Office of Environmental Education, education and training activities, model practices, methods and technologies, cooperative agreements, internships and fellowship, and awards is set at \$10 million for fiscal years 1992 and 1993, and \$12 million for fiscal years 1993 and 1994. The Foundation is authorized at \$1.5 million for fiscal years 1992—1995.

APPENDIX III

SAMPLE ENVIRONMENTAL EDUCATION ACT (Model Legislation)

This draft act enables a state to establish an environmental education program to facilitate the achievement of an environmentally literate citizenry through both the formal education system and community and state agency activities.

Most state constitutions reflect the right of their citizens to a clean and healthy environment. States are also responsible for public education. The maintenance of environmental quality depends on a public with a basic understanding of ecological principles, an awareness of environmental issues, possession of the skills necessary to act on those issues, and the motivation to solve existing environmental problems and prevent new ones. This draft legislation puts in place a state program to educate citizens accordingly for the protection of their environment.

This act is based on existing environmental education acts in Arizona (1990), Florida (1990 and 1992 amendments), Kentucky (1990, enacted but not funded), Minnesota (1990), Ohio, Pennsylvania (proposed), Texas (1991), and Wisconsin (1990). The act establishes an environmental education board to guide the state environmental education program, an office of environmental education to implement it, and an interagency coordinating committee to facilitate cooperation among state agencies. It calls for the development of a state plan for environmental education, a grants program, and regional environmental education centers. It requires development of an environmental education curriculum framework for grades K through 12 and environmental education studies for teacher pre-service and in-service education programs, as well as undergraduate education. The act also sets forth state agency duties for nonformal environmental education initiatives. It creates a finance mechanism and makes suggestions for other funding methods.

The act was drafted by a subcommittee of the Council of State Governments' National Environmental Task Force.⁴ The subcommittee and additional reviewers represent state and federal education, environmental protection and natural resources agencies, state legislators, academic institutions, environmental public interest organizations, and the corporate sector.

Suggested Legislation

(Title, enacting clause, etc.)

Section 1. [Short Title.] This act may be cited as the [state] Environmental Education Act.

Section 2. [Mission Statement.]

(a) It is in the public interest that a comprehensive environmental education initiative be undertaken that will result in environmentally literate citizens who will effectively and constructively solve existing environmental problems, prevent new ones, and maintain a sustainable environment for future generations. The appropriate audiences for environmental education include formal education, business, government, non-profits, and citizens.

(b) Characteristics of an environmentally literate citizenry must include:

⁴The Council of State Governments, Center for Environment, P. O. Box 11910, Lexington, KY 40578. The Environmental Task Force is submitting this act to the Council's Suggested State Legislation program for publication in its 1993 volume.

- (1) Ecological literacy - a basic understanding of:
 - (i) ecological principles and concepts and their application;
 - (ii) the cause and effect relationship between human behavior and the environment; and
 - (iii) the economics of that relationship.
 - (2) Civics literacy - a basic understanding of the decision-making processes of governments, business and other social, political, and economic institutions impinging upon environmental issues.
 - (3) Mathematical, technological, and scientific literacy - an understanding of the basic concepts of math and science to evaluate environmental problems and make sound decisions regarding their resolution.
 - (4) Personal and social action skills - develop and use skills such as problem-solving, risk analysis, and integrating diverse perspectives to understand and contribute to decision-making processes.
 - (5) Attitudes - expression of care for other humans, present and future, and for other components of the environment. These attitudes also affect understanding of ecology and civic responsibility.
 - (6) Motivation for action - the commitment to act for a healthy environment based on one's attitudes, knowledge, and skills.
- (c) There is hereby created a statewide environmental education program to implement the purpose of this act. The program shall consist of an environmental education board, an office of environmental education, an interagency coordinating committee, a state plan, environmental education centers, a curriculum framework, teacher and undergraduate environmental education programs, nonformal programs, and a finance and grants program.

Section 3. [Environmental Education Board.]

- (a) There is created an [environmental education board] attached for administrative purposes to the department of education or natural resources. The [board] shall identify needs and set priorities for environmental education within the state. It shall be responsible for reviewing, approving, and transmitting a plan for environmental education to the Governor and the Legislature every two years. An annual appropriation should be provided to finance the operation of the [board]. The appropriation level would range from \$50,000 to \$100,000 depending upon the size, needs, and resources of the state. Staffing of the [board] shall be provided by the [office of environmental education].
- (b) The [board] shall provide advice and assistance to the governor, the legislature, the [office of environmental education], and other state agencies, including university extensions, conservation and environmental organizations, community action services, and nature and environmental centers on policies and practices needed to provide environmental education. The [board] shall serve as a forum for the discussion and study of problems that affect the environment and environmental education. It shall provide assistance to and obtain information from the [interagency committee] to coordinate the environmental education programs of state agencies.
- (c) The [board] shall be responsible for the administration of the state's environmental education grants program. The [board] shall promulgate rules establishing the procedure for the awarding of grants. Grants under this section may not be used to replace funding available from other sources. No more than one-third of the total amount awarded in grants in any fiscal year may be awarded to state agencies.
- (d) The [board] shall be appointed by the governor for staggered three-year terms and include a balance of government and non-governmental entities that consists of the following members or their designees with experience in environmental education.
- (1) state superintendent of public instruction;
 - (2) secretary of environmental protection;
 - (3) tribal government (if applicable);
 - (4) secretary of natural resources;
 - (5) one majority and one minority party member of each house of the legislature.
 - (6) board of regents;

- (7) environmental advocacy organizations;
- (8) industrial community;
- (9) small business;
- (10) municipal corporations;
- (11) elementary and secondary school teachers;
- (12) ethnic minorities; and
- (13) a professional environmental scientist.

Section 4. [Office of Environmental Education.]

(a) A state [office of environmental education] shall be established by the legislature. It shall be headed by an environmental educator who is appointed by the state [environmental education board]. The [office] should have supra-agency authority and dependable funding. It may be administratively attached to an existing agency such as the education or natural resources department.

(b) The responsibilities of the [office] shall include:

- (1) Assess the status of environmental literacy in the state's students, teachers and citizens every two years.
- (2) Prepare a plan for environmental education every two years at the direction of the [environmental education board] and with the assistance of the [interagency coordinating committee].
- (3) Provide assistance to the [environmental education board] in the administration and evaluation of the state environmental education grants program.
- (4) Promote and aid in the establishment and evaluation of learner outcomes for pre K-12 school environmental education programs through cooperation with the [department of education].
- (5) Promote and aid in the development of pre-service and in-service environmental education programs for teachers through cooperation with the [council on higher education] or its equivalent and the state's colleges and universities.
- (6) Cooperate with federal government and state agencies and the private sector in developing, promoting and evaluating programs of environmental education.
- (7) Function as an environmental education clearinghouse by:
 - (i) reviewing and recommending environmental education materials;
 - (ii) cooperating with state agencies and organizations in the development and distribution of an environmental education newsletter;
 - (iii) establishing an electronic capacity to disseminate databases of environmental education information and to network with interstate and federal programs.
- (8) Promote the development of cooperative environmental education initiatives with the private sector.
- (9) Initiate, develop, implement, evaluate, and market nonformal environmental education programs; facilitate, encourage and support multi-school district cooperative efforts to assess the need for, develop and evaluate environmental education curriculums; promote state government and private sector policy that is consistent with the environmental education strategic plan established in paragraph 2, and coordinate nonformal environmental education with the K-12 and postsecondary environmental education program.
- (10) Initiate research on environmental education as called for in the strategic plan by issuing contracts to colleges, universities, and other research based institutions.
- (11) Coordinate an environmental education conference on a periodic basis to assist in the dissemination, development and achievement of the state's environmental education strategic plan.

(c) Staffing. The [office of environmental education] should be administered by a professional environmental educator and staffed with personnel having appropriate expertise and education.

Section 5. [Interagency Environmental Education Committee.]

(a) An [interagency environmental education committee] shall be established to promote networking, coordination, and cooperation among state

agencies and federal, tribal, and local agencies to promote the efficient distribution of information and to facilitate the planning and development of educational programs and materials. One agency shall be given responsibility for convening and facilitating the functions of the committee.

(b) The [committee] shall be composed of persons with experience in environmental education and the members shall consist of employees of the following agencies that have been appointed by the agency head: state departments of education, economic development, environmental protection, resource management, land, parks, water resources, tourism, environment commission, geological survey, energy, fish and wildlife, agriculture, mining, attorney general, health, transportation, local government/community affairs, general services, local conservation districts, county extension, community services, youth groups, and minority affairs. The chairperson shall be elected by the members.

(c) Members of the [committee] shall also serve as environmental education coordinators for their respective agencies, and shall direct an assessment of their own agency's target audiences and appropriate programs. The [committee] shall establish subcommittees as needed and assist with the development and implementation of the state's environmental education strategic plan.

(d) The [committee] shall develop and maintain a memorandum of understanding to specify methods by which the agencies can share their resources to benefit environmental education in the state.

(e) Members of the [committee] are not eligible to receive compensation and are not eligible for reimbursement of expenses from the committee.

Section 6. [State Plan.] The [office of environmental education], with assistance from the [interagency committee] should coordinate, write and publish a plan for environmental education. It should be reviewed and approved by the state [environmental education board] and transmitted to the governor and the legislature every two years. A report on the status of environmental literacy in the state should be conducted every two years to serve as a basis for the plan. The plan shall be officially called the "Governor's Plan for Environmental Education."

Section 7. [Grants Program.] The [environmental education board] shall award grants annually to non-profit organizations and public agencies for the development, dissemination, and evaluation of environmental education programs. Proposals addressing needs and priorities identified by the [board] or included in the strategic plan should receive priority. The [office of environmental education] staff shall administer the grants program and develop an evaluation plan. Grant recipients must provide a match of at least 25% of the amount of the grant. No more than 33% of the grant funds shall be awarded to state agencies in one year. The [environmental education board] shall promulgate rules establishing the specific criteria and guidelines for the program. An annual state appropriation ranging from \$200,000 to \$2,500,000 shall be provided to fund the grants program. Funding mechanisms are described in the Finance section which follows.

Section 8. [Environmental Education Centers.]

(a) Regional environmental education centers should be established at state universities. They should perform the following functions:

- (1) provide graduate level and continuing education courses for educators;
- (2) develop and maintain a resource library for teachers and other educators that includes curriculum materials, software, and audio visual materials;
- (3) provide assistance to schools in the development of their environmental education curricula;
- (4) coordinate an annual conference for resource providers and educators to share, plan and implement environmental education;
- (5) support teachers to conduct action research or classroom-based research on environmental education strategies and student outcomes;
- (6) network with interstate, federal, regional, and tribal environmental education and training centers;
- (7) provide for residential environmental education experiences for all students.

(b) Regional environmental education centers shall receive an annual appropriation to finance the staff, travel and supplies necessary to carry out these functions.

Section 9. [Curriculum Framework.]

(a) The [office of environmental education] and the [environmental education board] shall work with the state [department of education] to develop a curriculum framework for establishing environmental education programs in all public and private elementary and secondary schools. The programs shall integrate environmental concepts, skills, and attitudes into the regular curriculum, where appropriate, including but not limited to:

- (1) basic ecological relationships including firsthand real life experiences in varied natural and built environments with organisms as they interact with their environment;
- (2) issue investigation, analysis, evaluation, problem-solving, prediction, and action skills that enable the student to understand concepts such as the interrelationships and interdependence of natural and human systems;
- (3) the values and behaviors of individuals, institutions, and nations regarding environmental problems;
- (4) alternative responses to environmental issues and their consequences; and
- (5) the potential controversies arising from multiple use patterns of public and private lands.

(b) Model Measurable Learner Outcomes. The program shall be implemented through the [department of education]. The program should be comprehensive and include learner outcomes, assessments, feedback mechanisms, and instructional processes. The [department of education] shall develop curriculum integration models for a measurable learner outcome-based environmental education program. The models must include:

- (i) the specific environmental education and curriculum integration goals;
- (ii) the various options to achieve the goals;
- (iii) a hierarchy of learner outcomes composed of state learner goals, integrated learner outcomes; program learner outcomes; and course, unit, and lesson learner outcomes;
- (iv) mechanisms to communicate the models;
- (v) an objective process to evaluate the progress to establish and implement a model integrated environmental education curriculum;
- (vi) methods to assess pupils' environmental learning.

Section 10. [Pre-service Teacher Education.]

(a) Pre-service education in environmental education is essential in order to foster an environmentally literate citizenry. Future teachers must acquire the content and teaching skills to effectively instruct students in preschool through grade 12.

(b) Teacher education pre-service programs are required to provide instruction in environmental education, including ecological concepts, environmental issues and problems, developmentally appropriate practices, and use of a variety of instructional curricula and materials. Teacher education should come from a variety of sectors, including academia, environmentalists, and the regulated communities.

(c) The [environmental education board] and the [office of environmental education] shall work with members of teacher education institutions, natural resources departments in colleges and universities, the state higher education council, the state board of regents, and representatives from private colleges and universities to develop guidelines for incorporating environmental education into teacher education requirements.

(d) In states where teacher exams are required, environmental education knowledge and teaching skills should be assessed by the exams.

(e) Pre-service teacher education should consist of the following components:

- (1) Definition of the environmental education competencies that teacher candidates are expected to acquire;
- (2) Definition of the acceptable approaches that can be used to develop the competencies;
- (3) A plan for evaluating the achievement of the competencies;

- (4) A plan for evaluating pre-service teacher environmental education programs and;
- (5) A timeline for implementing the required pre-service education programs at colleges and universities.

Section 11. [Staff Development: K-12 Teachers (In-service Education).]
In-service teachers should develop the same environmental education competencies specified for pre-service teachers. To accomplish this:

- (1) In-service education in environmental education should be added to the courses recommended or required for recertification or licensing;
- (2) Every teacher education institution shall be required to offer both pre-service and in-service courses in environmental education;
- (3) State natural resources, environmental protection, parks, health and human services and education agencies shall develop and publicize environmental education teacher in-services and/or professional internships related to their mission;
- (4) School districts shall be encouraged to develop environmental education staff development plans and seek matching funding for implementation of these plans from the state grants program.

Section 12. [Undergraduate Environmental Education.]

(a) Universities, colleges and vocational institutions are required to implement programs that encourage environmental literacy and provide opportunities for environmental stewardship among the student population.

(b) Such programs shall include at a minimum:

- (1) Course Requirement. Implementation of an environmental studies course requirement for all graduates, or the development of an integrated general education program that accomplishes environmental literacy through its integration in a variety of required courses.
- (2) Comprehensive Program Planning. The state higher education coordinating council or board of regents shall plan and implement the following programs:
 - (i) Environmental audit. Institutions shall conduct an annual environmental audit to review the environmental and economic impact of the institution's operations. This evaluation should include a review of purchasing, waste disposal, energy usage and transportation practices. Institutions should implement methods and processes to reduce the negative impacts of these activities on the environment.
 - (ii) Assessment. Each institution shall review their activities (curriculum, internships, work study program, scholarships) to evaluate how they can promote environmental literacy among their student population.
 - (iii) Faculty development. Each institution shall provide opportunities and incentives for faculty of all disciplines to learn how they can contribute to developing environmental literacy in the student body.
 - (iv) Consortium. A consortium shall be developed to facilitate communication about existing environmental education programs.
 - (v) Environmental centers. Institutions shall be selected on a regional basis to serve as environmental centers to accomplish the functions in the previous section.
 - (vi) Competency identification and assessment. Environmental literacy competencies required for all graduates should be identified and a plan for assessing the achievement of these competencies shall be developed and implemented.
 - (vii) Environmental careers. Institutions should be encouraged to offer environmental career awareness workshops for high school students and especially for under-represented populations.

Section 13. [Nonformal Education.]

(a) "Nonformal" refers to education conducted outside of traditional formal education systems. The audiences for nonformal environmental education are numerous and quite diverse. They include: general public, youth and adult groups, local government, business and industry, environmental and conservation organizations, the media, elderly, and ethnic and cultural groups.

(b) Nonformal programs should focus on communities, the media, and other state agencies not traditionally considered part of the environmental protection/natural resources agenda.

(c) All state agency mission statements and particularly environmental protection or resource management agencies shall contain an environmental education component.

(d) Agency Duties. An agency shall be charged with the following duties:

- (1) Establish a committee within the agency of representatives of all programs conducting education activities to facilitate coordination and communications;
- (2) Conduct a periodic assessment of nonformal environmental education offered by the agency throughout the state;
- (3) Maintain an inventory of its environmental education materials, programs and resources;
- (4) Prepare a periodic report to the [interagency coordinating committee] and the state [environmental education board] outlining environmental education programs, activities and needs;
- (5) Identify target audiences and programs;
- (6) Environmental protection leadership: state agency internal operations should serve as a model for waste and pollution reduction, energy efficiency, and protection, preservation, and management of natural resources. The state [interagency committee] shall outline ways in which state agencies can implement model environmental policies such as office waste reduction and recycling, employee incentives for using mass transit, workplace energy conservation, native landscape planting and native plant and wildlife habitat restoration around state office buildings, printing on recycled paper, procuring paper with recycled content, and recycling of used oil and tires from state auto fleets;
- (7) Educate the regulated community (operators, builders, developers, private landowners, agriculture, water and air dischargers, water and sewer authorities, and local government) to promote:
 - (i) conservation and environmental protection;
 - (ii) economic benefits of protecting the environment;
 - (iii) the intrinsic valuing of natural resources;
 - (iv) development/enhancement of a corporate environmental ethic and responsibility for environmental protection;
- (8) Promote programs for the regulated community that:
 - (i) provide examples of economically viable business/industry activities which have also benefitted the environment;
 - (ii) provide education programs and field experiences;
 - (iii) establish awards programs (waste reduction award, environmental protection award, community action award, best management practices award, habitat restoration award, etc.);
 - (iv) establish or promote the development of an industry council on environmental education to promote industry partnerships;
 - (v) facilitate innovative industry environmental problem solving;
 - (vi) provide work place environmental education materials;
 - (vii) promote public/private partnerships for environmental education programs and initiatives.

Section 14. [Finance.]

(a) Funds will be necessary to implement the environmental education program and create the [environmental education board], [office of environmental education], and the grants program.

(b) There is hereby created a special nonlapsing environmental

education trust fund in the state treasury. Monies for the fund shall be authorized by the state legislature. All monies placed in the fund and the interest it accrues are hereby appropriated, upon authorization by the governor and with advice from the [board], to accomplish the purposes of this act. All monies in the fund shall only be used for environmental education. This fund is exempt from provisions relating to lapsing of appropriations. On notice from the [board], the state treasurer shall invest and divest monies in the fund. The state treasurer shall credit all monies earned from these investments to the fund. The [board] shall develop a plan for the expenditure of monies in the fund.

Section 15. [Effective Date.] [Insert effective date.]

A NOTE ON FINANCE MECHANISMS

There are many methods by which states can fund environmental education activities. The following evaluation criteria are recommended for deciding which type of funding mechanism to use:

- (1) reliability/dependability
 - (a) earmarking capability
 - (b) several sources
- (2) relationship to natural resources or environmental quality
- (3) political acceptability
 - (a) competition with other sources
 - (b) least controversial

Funding mechanisms from which the state may want to choose include:

- (1) general fund
- (2) segregated funds (e.g., state angling and hunting license fees and federal funds such as EPA, Pittman-Robertson, Dingell-Johnson, and Wallop-Breaux)
- (3) automobile license fees
- (4) solid waste fees
- (5) donations and grants as supplemental sources
- (6) others such as fines, special taxes, and lottery.

Potential new sources of funding include:

- (1) a per capita environmental education appropriation;
- (2) a state-sanctioned nonprofit foundation whose purpose would be to accept donations and raise funds from private and federal sources.

Funding mechanisms can be protected by implementing the following procedures:

- (1) build in evaluation;
- (2) show outcomes;
- (3) base fees on environmental indicators;
- (4) user survey to show public support.

Funding mechanisms currently in use by states with mandated environmental education programs are as follows:

- (1) general fund
- (2) automobile license fees
- (3) solid waste fees
- (4) donations and grants
- (5) surcharge on air and water pollution fines

Other mechanisms include:

- (1) severance taxes
- (2) dedicated fees
- (3) auto fees: air emissions, inspection sticker add-on
- (4) tax form check-off
- (5) utility fees
- (6) pollution fines
- (7) "sin" tax (on tobacco and alcohol)
- (8) trust fund investment
- (9) lottery

GLOSSARY

Biochemical Cycling - natural processes that recycle nutrients in various chemical forms from the environment, to organisms, and then back to the environment.

Biodiversity - the variety of different species, genetic variability among individuals within each species, and variety of ecosystems.

Biosphere - the portion of the earth and its atmosphere that can support life.

Built Environment - the portion of the environment managed or constructed by people.

Certificate/Endorsement - a document that recognizes the acquisition of special knowledge on the environment. This is not part of DESE's teacher certification program.

Conservation - the wise use of natural resources.

Curriculum Framework - a guide which identifies by grade level(s) material all students should know and be able to do in a subject and which should be incorporated into local school districts' curricula.

Ecology - study of the relationships of living organisms with each other and with their environment; study of the structure and function of nature.

Ecosystem - self-sustaining and self-regulating community of organisms interacting with one another and with their environment.

EECC - Environmental Education Coordinating Council

EIERA - Environmental Improvement & Energy Resources Authority

Environment - the sum total of all the external conditions that may act upon an organism or community to influence its development or existence.

Environmental Education - education which deals with ecologically related social issues in the environment, and focuses on the development of responsible citizenship behaviors regarding these issues.

Environmental Education Plan - a plan that focuses on the development of an environmentally literate citizenry.

Environmental Issues - particular interactions between humans and their environment about which there are differing beliefs and values.

Environmental Literacy - the understanding of the key concepts and principles of environmental science and how to best use the knowledge to reflect responsible citizenship.

Environmental Strategies - a plan of action based on the objectives of an environmentally literate citizen.

Exosphere - the outer most portion of the earth's atmosphere.

Formal Education - education gained in a K-12 institutional setting.

Higher Education - undergraduate and post-graduate studies.

In-service Training - teacher training acquired after state certification.

Multi-disciplinary - a skill or skills included in several academic disciplines.

Nonformal Education - education gained in a setting other than a formal or higher education setting.

OEE - Office of Environmental Education.

Pre-Service Training - training received before certification.

Primary Resources - firsthand research such as surveys, questionnaires, opinionnaires, and interviews.

REEC - Regional Environmental Education Center.

Secondary Resources - published articles or similar references.

Sloughs - a wet or marshy area.

BIBLIOGRAPHY

A Glossary of Selected Terms of Conservation, Ecology and Resource Use, compiled by Neil Jenkins, Missouri Department of Conservation, 1992.

Hungerford, Harold R.; Litherland, Ralph A.; Peyton, Ben; Ramsey, John M.; Volk, Trudi; *Investigating and Evaluating Environmental Issues and Actions; Skill Development*. Stipes Publishing Company, Champaign, Ill., 1992.

Miller, G. Tyler Jr., *Environmental Science*; Wadsworth Publishing Company, Belmont, CA., 1991.

Nelson, Paul W., *The Terrestrial Natural Communities of Missouri*, Missouri Natural Areas Committee, 1987.

The National Environmental Education Act, P.L. 101-619 (1990); 20 U.S.C.A. § 5501.